

Claims

1. Cosmetic composition comprising
 - (a) at least one compound selected from the group consisting of ascorbic acid, ascorbic acid derivative and an ascorbic acid salt,
 - (b) an enzyme that catalyzes the enzymatical oxidation of said of ascorbic acid, ascorbic acid derivative or ascorbic acid salt and
 - (c) at least one cosmetic ingredient.
2. The composition as defined in claim 1 wherein the pH is from 1.5 to 10.
3. The composition as defined in claim 1 wherein the pH is from 3.5 to 8.
4. The composition as defined in claim 1, 2 or 3 wherein the composition is a hair treatment composition.
5. The composition as defined in claim 1, 2, 3 or 4, in which said enzyme is selected from an oxygen-utilizing ascorbate oxidase.
6. The composition as defined in claim 5, wherein the enzyme belongs to the Enzyme Commission class [1.10.3.3].
7. The composition as defined in claim 5 or 6, wherein the enzyme is of plant origin.
8. The composition as defined in claim 7, wherein the enzyme is derived from *Arabidopsis*, *Brassica*, *Cucumis*, *Cucurbita*, *Myrothecium*, *Nicotiana*, *Oryza*, *Sinapis*, *Titicum* species.

9. The composition as defined in claim 8, wherein the enzyme is derived from *Cucurbita pepo medullosa* (zucchini).
10. The composition as defined in claim 1, 2, 3, 4 or 5, wherein the enzyme is a cloned enzyme expressed in cultured cells or an organism other than that from which the gene for the enzyme is derived.
11. The composition as defined in claim 10, wherein the enzyme is expressed in bacterial or yeast cultures.
12. The composition as defined in claim 10 or 11, wherein the enzyme is derived from bacterial or fungal species.
13. The composition as defined in claim 5, 6, 7, 8, 9, 10, 11 or 12, wherein the enzyme is stabilized by a substance selected from the group consisting of buffers, glycerol, polyhydroxy compounds, metal chelating agents, thiols, polyethylene glycol and nonreactive proteins.
14. The composition as defined in claim 5, 6, 7, 8, 9, 10, 11 or 12, wherein the enzyme is stabilized by immobilisation.
15. The composition as defined in claim 14, wherein the immobilisation is made by covalently attaching the enzymes to a solid support selected from the group consisting of microparticles of surface-modified silica, alumina, glass, oxirane-modified polymethacrylate, carboxyalkylcellulose, aminoalkylsilica, aminoalkyl glass, aminoalkyl cellulose, carboxyalkyl cellulose, dialkylamino-substituted cellulose, polyethylene glycol (PEG), polyacrylic acid, polyvinyl alcohol, polyethyleneimine, dextran, gelatin and uricase.

16. The composition as defined in claim 1, wherein said enzyme is contained in a concentration of from 1 to 10000 ppm, whereas this is the concentration of ascorbate oxidase in the ready-to-use composition immediately after mixing of all components of this composition.
17. The composition as defined in claim 1, wherein said enzyme is contained in a concentration of from 10 to 1000 ppm, whereas this is the concentration of ascorbate oxidase in the ready-to-use composition immediately after mixing of all components of this composition.
18. The composition as defined in claim 1, wherein the ascorbic acid, ascorbic acid derivative and/or ascorbic acid salt is present as an anhydrous powder, a granulate, a coated material, a tablet or micro-encapsulated.
19. The composition as defined in claim 1, wherein the cosmetic ingredient is selected from the group consisting of thickening agents, such as bentonite, kaolin, fatty acids, starch, guar gum, high molecular weight fatty alcohols, polyacrylic acid and its derivatives, cellulose derivatives, alginates, Vaseline, paraffin oils, wetting agents or emulsifiers from the classes of anionic, cationic, amphoteric or nonionic surface-active substances, such as fatty alcohol sulfates, fatty alcohol ether sulfates, alkylsulfonates, alkylbenzenesulfates, quaternary ammonium salts, alkylbetaines, ethoxylated alkylphenols, fatty acid alkanolamides or ethoxylated fatty esters, furthermore opacifiers, such as polyethylene glycol esters, alcohols, such as ethanol, propanol, isopropanol, polyols, such as ethylene glycol, 1,2- or 1,3-dihydroxy-propane, 1,2-, 1,3- or 1,4-dihydroxy-butane, 1,2-, 1,3-, 1,4- or 1,5-dihydroxy-pentane and glycerin, sugars, such as D-glucose, solubilizers, stabilizers, buffering substances, perfume oils, dyes as well as hair conditioning and hair care components, such as cationic polymers, silicone polymers, cationic silicone polymers, UV-filters, betaine, lanolin, lanolin derivatives, protein derivatives and protein hydrolysates, amino acids, cholesterol,

pantothenic acid, vitamins, provitamins and plant extracts.

20. The composition as defined in claim 1, wherein the ascorbic acid, ascorbic acid derivative and/or ascorbic acid salt is present in a concentration of from about 0.1 to about 20% by weight in the ready-for-use composition.
21. The composition as defined in claim 20, wherein the ascorbic acid, ascorbic acid derivative and/or ascorbic acid salt is present in a concentration of from about 0.5 to about 10% by weight in the ready-for-use composition.
22. The composition as defined in claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 or 21 whereby said cosmetic composition is a hair fixing composition for permanently shaping hair.
23. The composition as defined in claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 or 22 whereby said composition is an aqueous solution.
24. A method for preparing a ready-to-use cosmetic composition for the oxidative treatment of skin or hair, said method comprising the steps of:
 - (i) providing a component (A) comprising at least one compound selected from the group of ascorbic acid, ascorbic acid derivative and ascorbic acid salt as well as at least one cosmetic ingredient;
 - (ii) providing a component (B) comprising an enzyme that catalyzes the enzymatical oxidation of said of ascorbic acid, ascorbic acid derivative and ascorbic acid salt;
 - (iii) providing a component (C) comprising oxygen;

- (iv) mixing components (A) and (B) from about 1 minute to about 20 minutes before application,
 - (v) mixing component (C) intensely with the mixture of components (A) and (B).
25. A method for preparing a ready-to-use cosmetic composition for the oxidative treatment of skin or hair, said method comprising the steps of:
- (i) providing a component (A'), comprising in dry solid form:
 - at least one compound selected from the group of ascorbic acid, ascorbic acid derivative and ascorbic acid salt;
 - at least an enzyme that catalyzes the enzymatical oxidation of said of ascorbic acid, ascorbic acid derivative and ascorbic acid salt; and
 - at least one cosmetic ingredient;
 - (ii) providing a component (B'), comprising an aqueous or aqueous-alcoholic composition;
 - (iii) providing a component (C') comprising oxygen;
 - (iv) mixing components (A') and (B') from about 1 minute to about 20 minutes before application,
 - (v) leaving component (C') to come into contact intensely with the mixture of components (A) and (B).

26. The method as defined in claim 24 or 25 wherein the oxygen is present in the form of air, purified oxygen gas, an oxygen containing mixture or any other oxygen gas releasing compound.
27. The method as defined in claim 24 or 25 wherein step (v) is carried out in a pressurized container.
28. The method as defined in claim 24 or 25 wherein step (v) is carried out in presence of a solution of one or more anionic, cationic, zwitterionic or nonionic surfactants appropriate to provide an oxygenated foam.
29. The method as defined in claim 24 or 25 wherein the oxygen in step (v) is chemically or physically bound in an oxygen containing compound.
30. A method for the oxidative treatment of keratin, said method comprising the steps of:
 - a) providing said cosmetic composition of any one of the claims 1 to 23,
 - (b) applying said cosmetic composition to the keratin,
 - (c) allowing said cosmetic composition to act on the keratin for a sufficient time, and
 - (d) rinsing the keratin.
31. A method as defined in claim 30, whereby the keratin is hair.
32. A method as defined in claim 30 or 31, whereby the oxidative treatment is a oxidative post treatment of reduced hair in the process of permanent shaping of hair.
33. A method as defined in claim 30, 31 or 32, whereby the sufficient time in step (c) is from about 5 minutes to about 25 minutes.

34. A method for permanently shaping hair, said method comprising the steps of:
- a) bringing the hair into a desired shape;
 - b) applying a keratin-reducing composition to the hair and allowing the keratin-reducing composition to act on the hair for a period of action sufficient for the permanent shaping of hair;
 - c) rinsing the hair after the applying and allowing of step b);
 - d) providing an oxidative hair fixing composition as defined in claim 22,
 - e) after the rinsing of step c), applying said oxidative hair fixing composition to the hair and allowing said oxidative hair fixing composition to act on the hair for a time sufficient for fixing of the hair in the desired shape; and
 - f) after the applying and the allowing of step e), rinsing the hair again.
35. A method for permanently waving hair, said method comprising the steps of:
- a) bringing the hair into a desired shape;
 - b) applying a keratin-reducing composition to the hair and allowing the keratin-reducing composition to act on the hair for a period of action sufficient for the permanent waving;
 - c) rinsing the hair after step b);
 - d) providing an oxidative hair fixing composition as defined in claim 22,
 - e) after the rinsing of step c), applying said oxidative composition as a pre-fixing composition to the hair and allowing said oxidative pre-fixing composition to act on the hair for a time sufficient for pre-fixing the hair; and
 - f) after the pre-fixing of the hair of step e), treating of the hair with an oxidative post-fixing composition for post-fixing the hair, said oxidative post-fixing composition containing from 0.1 to 1 percent by weight of hydrogen peroxide or from 1 to 5 percent by weight of bromate as oxidizing agent.

36. The method as defined in claim 35, wherein said oxidative pre-fixing composition is a solution and has a pH of 3.5 to 9.